Ratepayer Summit

Living & Surviving (?) in Today's High Cost Environment

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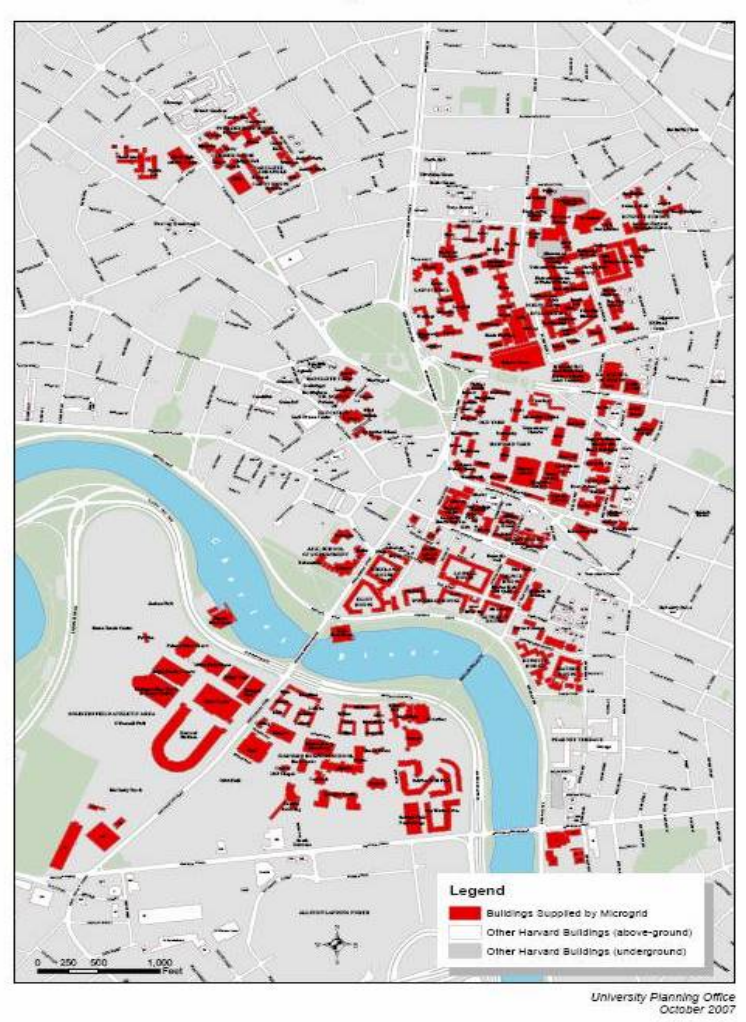
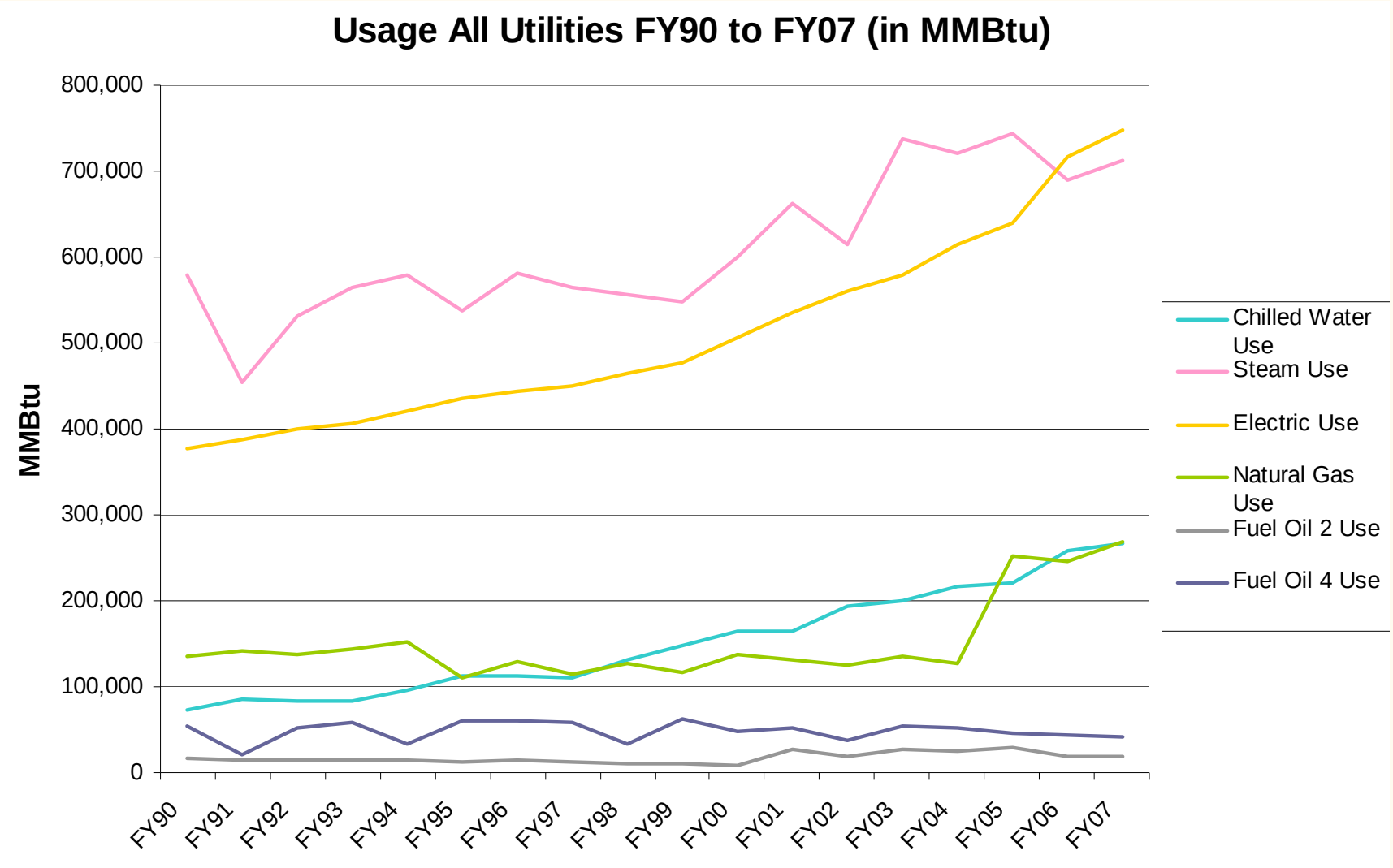
Harvard's Energy Infrastructure

- **Electricity**
  - ~50 MW peak, ~250 million kWh
- **Steam**
  - Blackstone Plant – Harvard's primary source of steam for process, heating and hot water
- **Chilled Water**
  - Central and satellite chiller plant serves 70 buildings on campus with chilled water



Energy Usage, FY90 to FY07



Overall Goals
Harvard's Energy Infrastructure

Leverage operational, economic, and environmental benefits to provide:

- Required reliability for University's research & teaching
- Energy efficient platform for provision of electricity, gas, steam, and chilled water to Harvard users
- Environmental framework to guide energy decisions
- Rate stability and predictability
- Flexibility for expansion using state-of-the-art technology

Challenges & Solutions

- 30% GHG reduction by 2016
  - Energy efficiency - >35,000 MWh savings
    - >$2 Million – Rebates
    - $12 Million Green campus loan fund
    - CEA collaboration
  - CHP installations
  - Fuel switching – Dual fuel capability permitted us to use 90% natural gas in FY08 rather than 70%
  - LEED – 42 Building, new & renovations
  - Renewables –
    - On campus installations
    - Purchases that exceed the RPS
    - Voluntary REC purchases
    - Research – Met Tower installation

Challenges & Solutions

- Rate Stability, Predictability, Reliability
  - Licensed Retail Supplier
    - Allows wholesale purchases for Harvard's 50 MW peak
    - Allows Portfolio approach, different quantities & different time periods
    - Requires market involvement
  - Cost Mitigation –
    - Manage price volatility
    - Manage fuel type decisions
  - Reliability –
    - Microgrids
    - CHP

Are Customers Surviving?

- How do we keep up with change?
  - Risk shifting to customers
    - Regulatory and environmental rules
      - Shields utilities & generators
      - Customers have limited time and funds to comment on proposed rules
  - Complex regulation and legislation
    - Implementation issues
    - Customer cost impact not known
    - Budget planning is difficult
    - Obscure Obligations & interpretations
  - Ratepayers are generally unaware
    - Energy and its costs are critical to end user but energy is not their business